

# CaseStudy

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Students Use NEPI for AI and Automation in Autonomous Ferry Project

### THE PROJECT

The University of Washington Tacoma's School of Engineering and Technology is spearheading an innovative Autonomous Ferry Project, funded by the WA Department of Transportation and aimed at revolutionizing maritime transport. Supported by Numurus and utilizing their NEPI software, a studentled team is integrating advanced AI and automation technologies to enable autonomous ferry operations.



## >>> THE CHALLENGE

Al-enabled robotic automation requires the integration and synchronization of multiple hardware and software technologies. The integration of these technologies is both timeconsuming and typically beyond the skill set of typical students working on such solutions, making it very difficult for both students and educators to incorporate these technologies into their programs.

# >>> THE SOLUTION

The UWT team chose Numurus' NEPI software for this project. NEPI provides a full-featured AI and automation development platform for NVIDIA Jetson processors that eliminates the need for extensive software experience when developing sophisticated automation solutions. With NEPI and an extensive library of documentation, guides, tutorials, and videos available at www.nepi.com, students with minimal software experience now have the tools and resources to jump into their AI and robotic automation efforts, not spending months learning and coding low-level software.

#### HEATHER DILLON, PROFESSOR OF MECHANICAL ENGINEERING, UW TACOMA

"Numurus' easy to learn NEPI software tutorials allowed our student-led team working on the autonomous ferry project to learn and apply cutting edge AI and robotic automation technologies with minimal software programming experience. We are excited to continue leveraging the NEPI engine in our autonomous ferry prototypes as our DOT funded project"



#### **NEPI-ENABLED FERRY AUTOMATION SOLUTION**



Pixhawk Autopilot

Local Operations Interface



## >>> THE PROCESS

Leveraging a NEPI-enabled NVIDIA Jetson developers kit provided by Numurus, team members have completed the following development steps in the development of their autonomous ferry project:

1) Developed a scaled model robotic ferry hull and installed a propellor based propulsion system, a PixHawk autopilot and INS navigation system, and a 3D ZED2 Stereo Camera from Stereo Labs.

2) Connected and tested the propulsion system, autopilot system, and stereo camera to the NEPI processor box using NEPI's plug-and-play driver library.

3) Collected "buoy" target image data, labeled the collected image data, and trained an "Buoy" Al detector model using NEPI integrated Al development tools. After training, the Al detector model was deployed to the NEPI box's Al model library folder and tested using NEPI's built-in Al detector application.

4) Used a combination of example and custom NEPI python automation scripts to create and test control and autonomy solutions for different ferry operations such as autonomous docking.

## THE FUTURE

Building on the initial project success, Numurus plans to work with UW Tacoma professors to take the materials develop in this project and create an AI and automation curriculum easily adaptable for STEM autonomy programs at UW Tacoma and other Universities around the world. The envisioned program will teach students the fundamentals of using and applying AI and automation technologies to real world robotic operations without requiring them to have extensive software experience.



Kickstart your next robotics project with Contact Numurus at: info@numurus.com



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